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Amazonas of Orellana; Bartholemeu Velho, in his map of 1464, represented a great central lake (Eupana) from which flowed to the south the Paraguay, to the north and entering the Amazonas the 'Paraa' (thus representing quite well the Tocantins), and to the east two rivers entering the São Francisco (quite well figured but united to the Paraná) which bifurcated to the coast of Maranhão by the river 'Abiunhao' (Parnahyba) and to that of Sergipe by the river 'Real.' This last feature persisted in maps until 1700.

The Gutierrez map, printed in Amsterdam in 1562, had an enormous recuperation and served as a prototype for a flood of maps characterized by a double Amazonas, published by the great Dutch printing firms of Ortelius, Mercator, etc. The equally bold conception of Bartholemeu Velho (reproduced, as regards the hydrography, by Vaz Dourado) had a somewhat more delayed entrance in current cartography, in which it was introduced in 1585 by Jan van Doet, whose map is essentially a reproduction of that of Bartholemeu Velho, of which the original only recently became known. These two types of maps, reproduced and modified *ad infinitum*, dominated cartography until 1625, when Jean de Laet, in the first edition of his great work on the New World, made a radical reform, introducing, on the basis of Portuguese marine charts and of Dutch explorations, the configuration which, improved but not essentially modified, has persisted till to-day. This last group of maps offers an interesting subject for study, for which, however, I have not the elements at hand. ORVILLE A. DERBY.

SÃO PAULO, BRAZIL,
June, 1903.

SCIENTIFIC BOOKS.

GOULD'S BIOGRAPHIC CLINICS.

MEDICAL teaching has always been essentially demonstrative; and in modern days the

facilities for bedside or 'clinical' instruction have been enormously enlarged. No instructor, however, has ever before gathered so distinguished an array of 'subjects' as Dr. George M. Gould brings before his world-class to illustrate his lectures upon 'Eye-strain.*' For it is in the irritation of nerve centers as a result of the accommodational strain necessitated by the attempt to use faulty visual apparatus in work requiring delicate adjustment and continuous effort, that this eminent lexicographer and ophthalmologist finds the ready explanation of the physical miseries of the great students, artists and writers whose pathologic life-history he studies. Certain common factors are found in these histories, not the least important of which are the early development and long persistence of the symptoms, their recurrence whenever the sufferer used the eyes in work or study, their resistance to all sorts of treatment, their relief when enforced rest from work gave unwitting deliverance from their cause and, finally, in those who survived to that period of life, their sudden disappearance, when accommodational effort ceased to be possible. The 'mysteriousness' which the symptoms seemed to assume both to patients and to physicians, is also a point well worth noting. To quote Dr. Gould's own words: "This lack of cause or reason for their sufferings struck each one, and pages of excerpts might be gathered showing their wonder. An unseen malignant enemy or fatality seemed seated above them or at the very heart of their being, implacable and unexplainable. To their physicians they turned with beseeching question, and imploring aid. Some spent a great part of their lives in going from one doctor to another, or in testing quackery, in traveling for hoped relief anywhere, by

*'Biographic Clinics: The Origin of the Ill Health of DeQuincey, Carlyle, Darwin, Huxley and Browning.' *Idem*, Volume II., George Eliot, George Henry Lewes, Wagner, Parkman, Jane Welch Carlyle, Spencer, Whittier, Margaret Fuller Ossoli and Nietzsche. By George M. Gould, M.D., Editor of *American Medicine*, Author of 'An Illustrated Dictionary of Medicine, Biology, etc.,' 'Borderland Studies,' 'The Meaning and Method of Life,' etc. Philadelphia, P. Blakiston's Son & Co., 1903, 1904.

'change of climate,' 'change of scene,' etc. Most of them tormented themselves all their lives in dieting, and two gave much of their life to the hydropathic delusion.* In every case the one fact stands out clearly, and it could be verified by any number of quotations, that their miseries were consequent directly and quickly upon use of their eyes in writing or reading, and yet not one of them, while repeatedly chronicling the fact with his own pen, ever caught a hint of the causal nexus."

Fully to appreciate the force of the evidence one must read the facts that Dr. Gould has patiently gathered not only from the narratives of biographers and relatives, but also from the letters and notes of the sufferers themselves. In Chapter I. of Volume II., which reproduces a paper upon 'Eye-strain and the Literary Life,' read before the Canadian Medical Association, the author summarizes and keenly analyzes the symptoms of these fourteen elect men and women. He points out the folly of attributing reflex symptoms to disease of the organ in which the distress happens to be manifested, thus treating the same person at different times for 'brain-fag,' for 'dyspepsia,' for 'neurasthenia,' or perhaps attributing the condition to 'pure cussedness.' He shows how, especially in the case of Nietzsche, a sensitive organism may be irritated almost to the point of madness by the continual torture following the attempt to use the eyes for work to which they are not adapted. The pity of it is that with suitable glasses—mark the word suitable—all this suffering might have been averted. Dr. Gould further shows that the chief and most poignant symptoms from which the subjects of his clinics suffered can, in at least ten of the cases, be reduced essentially to the symptom-complex now termed 'hemicrania' or 'migraine'—in ordinary language, 'sick headache.' Hence the frequent recurrence of gastric distress, distaste for food, nausea, vomiting, pain in the head—hence the frequent erroneous accusation of stomach, brain, nerves, liver—hence the frequent invocation of that indefinite scape-goat, 'biliousness.'

* Which is something far different from scientific hydrotherapy.—S. S. C.

The dependence of migraine upon eye-strain as an exciting cause in a large number, perhaps the largest number of cases can no longer be denied by the most doubting Thomas. The writer of this review placed himself upon record to that effect so long ago as 1892. It is true, however, and here we probably differ from Dr. Gould, that in order for the eye-strain reflex to take the form of this particular paroxysmal neurosis the individual must present that special type of organization in which the inhibition or, to use a broader term, the taxis, of the vaso-motor mechanism is deficient—a defect* usually inherited but sometimes acquired by unwise living or in sequel to some pathologic accident. Otherwise the persistently recurring disorder would be much more common than it is among those whose eyes present the very common faults of astigmatism and hyperopia, as likewise among myopes having high degrees of ametropia. Also, in individuals presenting vasomotor ataxia, other exciting causes, likewise, may provoke the attack of migraine, as of asthma, of hayfever, or of some other nerve-storm. Be this as it may, the relief of eye-strain, by guarding the powder from at least one of the sparks that threaten, prevents that particular explosion.

Dr. Gould's great merit lies not so much in his individual theory of the causation of migraine as in his directing strongly the attention of the medical profession and, it is to be hoped, of workers in literature and science who are not physicians, to the necessity for eyes and the relief of eye-strain by suitable glasses, with recorection from time to time, as the refraction alters and the reflex disturbances recur; the other, and in some respects greater, being the importance of gathering all facts concerning the ill health of any individual into a comprehensive whole, rather than to consider detached fragments as things utterly apart. As the writer has elsewhere expressed the same thought, 'the spokes are

* From the physical standpoint a defect; but in my observation so frequently associated with marked artistic and intellectual ability, that I am not sure that in moderate degree it is less than an advantage to a writer, actor or public speaker. S. S. C.

many, but the hub is one.' This method applies indirectly even to pathologic accidents such as acute infections; but its direct bearing is of course upon what may be termed the basic condition of health or disorder.

Many ophthalmologists of high repute and many internists ('general physicians') of experience and authority concur in greater or less extent with the views that Dr. Gould puts forth, but others of equal standing, and among them many reviewers in the medical press, differ from him radically; and some have even sought to cast ridicule upon 'Biographic Clinics' and their author because of what are termed his 'extreme' assertions. Doubtless he is over-emphatic. He has an earnest and virile style and evidently feels deeply upon the subject he is treating. There can be no mistaking his earnestness or his meaning and there can be no doubt that he arraigns with some bitterness, not his brother practitioners, but the inertia or the blindness that has delayed their full acceptance of the great medical truth to which he calls attention and to the development of which Dyer, Weir Mitchell, Thomson and Norris, of Philadelphia, Martin, of Paris, and others, including Dr. Gould himself, have contributed importantly.

Nobody likes to be scolded in public, and Dr. Gould has not been wise in seeming to scold. Grant this, however, and the truth still remains true. Grant, moreover, that he is extreme in the statement of the truth—let us then forget the 'extremity' of the statement and remember the verity of the fact stated. Unquestionably it is a truth of vast significance. Unquestionably physicians have not yet fully realized that significance.

The great importance of the eyes in human life and work, or the complexity of the work demanded of the eyes by modern civilization, need not be dilated upon. Our early ancestors had greatest need of good distant vision, and their range was bounded only by the sky and by the horizon. We spend much of our time within narrow walls and beneath low ceilings; walls too narrow, ceilings too low, even in palaces. In addition, we read or write or sew or paint or do surgical operations or decipher cuneiform inscriptions or study palimpsests

or set type or look through microscopes or work at machines of various kinds, demanding close sight and more or less constant accommodational effort. Few are born nowadays with natural optical apparatus perfectly adapted to the environment. Some are fortunate enough not to undertake just exactly those lines of endeavor that call for the greatest use or most delicate adjustment of the ocular mechanism. Moreover, in many cases a fair approximation to good refraction answers; a pair of glasses is obtained which more or less imperfectly corrects the error, and all goes well. There are many persons, however, in whom, whether from natural sensitiveness of temperament, from the complexity, obscurity or magnitude of the ocular defect, from the excessive amount of eye-work done, or from failure of general health rendering the whole organism more sensitive to peripheral irritation, neglect of the eye or happy-go-lucky correction will not serve. Eye-strain ensues; asthenopic reflexes of all kinds are set up and these may be as varied in kind or grouping as the number of organs in the body multiplied by the number of possible individual peculiarities, and then as the number of possible permutations among the figures thus obtained.

'Eye-strain,' it is to be added, does not mean exclusively, or even chiefly, strain of the external muscles of the eye. Muscular defects may or may not, as Dr. Gould contends, be dependent in every instance upon refractive error—that it is so in many instances must be admitted. In any event accommodational strain is the fact of greatest importance. Moreover, Dr. Gould asserts that astigmatism is, of refractive errors, the one causing greatest distress. This is borne out not only by the personal experience of the writer as a patient, but also by his observation as a physician and the reports of many oculists to whom he has referred patients presenting reflex symptoms. Nor can any, however small, amount of astigmatism safely be treated as the old French doctor is said to have advised his students to treat a cold in the head—'with contempt.' The smallest appreciable amount needs correction. Astigmatism imperfectly

corrected is astigmatism uncorrected; and it continues to excite reflexes—cerebral, muscular, cardiac, respiratory, digestional or what-not.

We should not like to be misunderstood as teaching that eye-strain is *fons et origo mali* to all the ills that flesh inherits; or even in every case of nerve exhaustion, headache or dyspepsia in students and writers. Neurasthenia, gout, indigestion, can develop in those whose eyes are emmetropic, or, if ametropic, have been skilfully corrected. Too much confinement, too little exercise, injudicious diet and other errors of temperament, work and habit may cause many and varied symptoms, in the entire absence of eye-strain. Nevertheless, it is to be admitted that even in cases of other fundamental origin an uncorrected or imperfectly corrected refractive error will aggravate or even precipitate the symptoms.

We are not willing to go so far as Dr. Gould in ascribing, for example, the final break-down of Nietzsche to eye-strain alone. Of two 'extreme' and untenable hypotheses concerning that brilliant unfortunate we prefer Gould's to Moebius's, but we accept neither. We have no third to offer, for the facts before us are not sufficient to warrant dogmatism. Certain it is, however, that much of Nietzsche's misery was due to eye-strain. True, his eyes were examined and treated, but in all probability there remained undiscovered or uncorrected some worrisome refractive error—for the Germans have yet much to learn of the art that owes so much to the science of great Germans. An odd or complicated astigmatism, possibly of low amount, may have eluded detection or there may have been failure to adjust properly glasses correctly prescribed, or the personal equation of the patient may not have been met skilfully—there are numerous possibilities; and one guess is as good or bad as another.

To sum up: Dr. Gould has conceived with the brain of a master thinker and inscribed with the pen of a ready writer two volumes of 'extreme' readability, interest and importance; on the whole wise in tone, always forceful, usually graceful, often elevated in diction;

unfortunately marred now and again by useless acidity or unnecessary denunciation. He has shown that much, if not all, of the constant or recurring distress of a number of the leading spirits of the nineteenth century—distress otherwise mysterious and unaccountable—was in all probability due to refractive defects of the eyes and the consequent accommodational strain made necessary during work. It might, therefore, have been relieved in large part, if not entirely, by suitable glasses; and this is the great, but therefore simple, lesson for physician and for patient. In emphasizing this lesson the author has emphasized old and unappreciated truth; he has also added to the sum of truth. It is a work well worth the doing; a work certainly not inferior to the invention of a new staining fluid, the synthesis of a new hypnotic drug or the description of a new symptom-complex; a work, of which the true value will become more apparent as the years increase.

SOLOMON SOLIS COHEN.

SCIENTIFIC JOURNALS AND ARTICLES.

THE April number of the *Botanical Gazette* contains the following articles: Mary Ellen Bennett, under the title 'Are Roots Aerotropic?' has shown that the claim of Molisch can not be sustained by her numerous experiments. She also offers a solution for the curvatures of roots recorded by him and termed aerotropic. Aven Nelson in his fifth 'Contributions from the Rocky Mountain Herbarium' describes a large number of new species, chiefly from southern Utah and southern Nevada. Florence Lyon discusses 'The Evolution of the Sex Organs of Plants,' upon the basis of numerous very interesting cases of exceptional development of antheridia and archegonia that she has found, chiefly among Pteridophytes. Charles Robertson makes a suggestive contribution to the phylogeny of Angiosperms from the standpoint of his study of the problems of pollination. His contention is that the primitive Angiosperms were entomophilous, and that the anemophilous ones are metamorphosed entomophilous flowers, whose seemingly simple structures are degraded, not primitive. F. V. Coville dis-